

Bugs Alive! A Guide to Keeping Australian Invertebrates

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Invertebrate husbandry includes the mass production of species for agricultural or medical research, production of food for vertebrates such as frogs, lizards and birds, for educational display purposes, and as a pursuit by naturalists. This book is a most welcome and timely addition to the literature to assist the latter interest group.

Readily available information for the interested naturalist has been limited. For example, Stone and Midwinter (1975), Murphy (1980), Stone (1992) and Clarke (2000) are often cited as general popular guides to keeping terrestrial invertebrates. Specialist books have been available, although until the spread of internet shopping, they were often difficult to access. These include hobbyist books on tarantulas and scorpions, stick insects, and booklets by the UK based Amateur Entomologists' Society on stick insects, hawk-moths, praying mantids, and butterflies. The Sonoran Arthropod Studies Institute (based in Arizona) magazine *Backyard Bugwatching* and the Proceedings of their annual Invertebrates in Captivity Conferences (held annually since 1993) contain a lot of generalist and specialist invertebrate husbandry advice.

With a few exceptions, all these books involve overseas species of insects that would not be permitted to be kept in Australia without special permits. The exceptions are several species of Australian stick insects (e.g. the Giant Spiny Stick Insect *Extatosoma tiaratum*) which have been bred in captivity for several years, primarily in the USA and in the UK. The literature produced on Australian species is minimal: the Densey Clyne (1978) book on keeping insects as pets, and Charles McCubbin's (1985) booklet on breeding butterflies.

Hence my pleasure in reviewing a book on keeping primarily Australian invertebrates in captivity. The approach of *Bugs Alive!* is similar to Clarke (2000) in that it provides detailed information on keeping selected species alive in captivity: information on the feeding, biology,



routine care and observations of captive behaviour. It starts off with information on suitable enclosures (physical design, temperature, humidity and lighting requirements). Luckily, there are a number of standard food mixtures that can be prepared to reduce the reliance on obtaining food from the wild (and in some species, not even knowing all the dietary elements required). The requirements for maintaining invertebrates is thoroughly covered, although I am surprised that there is no mention of the use of cool temperatures (such as the refrigerator) to slow down active invertebrates if required when handling them.

Information is presented on 91 species of invertebrates: ants (5 species), beetles (11), butterflies and moths (5), cockroaches (5), grasshoppers, crickets and katydids (17), mantids (4), stick insects (6), bugs (4), wasps (2), spiders (15), scorpions (4), centipedes (3), millipedes (3), and slugs and snails (7). Not all of

these species are suitable for the naturalist or for children – some species can be dangerous, (e.g. Sydney funnel-web spiders) and are not recommended, while others are highly threatened, (e.g. the Lord Howe Island Stick Insect, which is kept in only a couple of institutions as part of a captive breeding programme). The information provided can be applied to a much larger number of species and the authors name some species with similar husbandry requirements in each entry.

The book is thorough, and more comprehensive than all the general books available in terms of the information and guidance it provides. The presentation is clear and easy to read, although it is not spelled out that technical terms in bold type are defined in the glossary.

There are a few minor points that need to be mentioned. From a conservation and quarantine perspective, a comment is required about purchasing invertebrates; while there are outlets in Australia to purchase native species, no mention is made that it is illegal (and dangerous to our environment) to purchase live material from overseas without the approval of proper authorities. Also, I think the text could have been a bit stronger on controlling the escape (or the disposal of excess numbers) of native species that are not endemic to the area in which they are being kept. Already there are native Australian species that have become established in parts of Australia where they are not normally found; this has been primarily due to the nursery trade, but the pet trade has the same potential. While the rearing of species under consideration is well presented, the rearing of some of the live food items is not thoroughly covered (e.g. rearing aphids on page 25 and mealworms on page 170). One minor error is the statement that the Giant Rainforest Centipede *Ethmostigmus rubripes* is found in the wet forests of northern Australia; its distribution is more widespread and this species occurs in parts of Victoria.

The authors provide a common name and a scientific name for each of the species listed. Some of the common names are those that are

officially recognised (under the CSIRO Handbook of Australian Insect Names), but I suspect the authors have made up some of the names simply because the species did not already have a common one. This is fine as long as the scientific name is the one used for accurate identification. On this point, there is one error in the use of scientific names: the Australian tarantulas are listed as *Phlogius* species, but the ones commonly kept and traded are species of *Selenocosmia*.

The authors could have included a few images of immature beetles, butterflies and caterpillars. Images of adults are presented, but certainly in the case of butterflies and moths, it is the larval stage that is kept in a husbandry situation. Surprisingly, the book does not include earthworms, any sap-sucking plant bugs (Homoptera), some of the common eucalypt insects (e.g. Saunders casemoth, chrysomelid beetles, Christmas beetles, sawflies) or, except for the water spiders, any aquatic invertebrates. Perhaps these will be in the next edition.

In summary, this is an excellent and most welcome addition to the naturalists' library. It is a book that should also be in every school library. Basic life history information is not available for much of the Australian invertebrate fauna, and this book provides a solid background for life history studies, something that naturalists of all ages can observe and record (and even write about in *The Victorian Naturalist!*).

References

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